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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/646,073

08/22/2003

David R. Shafer

KLAC0076

8450

30438

7590

08/17/2010

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EXAMINER

PRITCHETT, JOSHUA L

ART UNIT

PAPER NUMBER

2872

MAIL DATE

DELIVERY MODE

08/17/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/646,073	Applicant(s) SHAHER ET AL.	
	Examiner /JOSHUA L. PRITCHETT/	Art Unit 2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 July 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 43-99 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 43-99 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 October 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Art Unit: 2872

DETAILED ACTION

This action is in response to Amendment filed July 26, 2010. Applicant amended claims 43, 55, 65, 78 and 90.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 43-51, 53-74, 76-86 and 88-99 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shafer (US 6,842,298) in view of Yonekubo (US 4,108,794).

Regarding claims 43, 46, 50-51, 53-55, 57, 59, 63, 65, 69, 73, 74, 76-78, 81, 85-86, 88-90, 92, 94 and 98, Shafer '298 teaches an objective (Fig. 6) for use with light energy having a wavelength in the range of approximately 157 nanometers through the infrared light range (Fig. 6) comprising: at least one focusing lens (602) having diameter less than approximately 100 millimeters (Fig. 6) receiving said light energy and transmitting focused light energy; at least one field lens (603) having diameter less than approximately 100 millimeters (Fig. 6), receiving said focused light energy and transmitting intermediate light energy; and at least one Mangin mirror element (604 and 606), which is an optical element, having diameter less than 100 millimeters

Art Unit: 2872

(Fig. 6) receiving said intermediate light energy and providing controlled light energy to a specimen (Fig. 6) and Mangin mirror group positioned between the field lens group and the specimen (Fig. 6); wherein each focusing lens and each field lens is formed from a single glass material (Table 3) wherein every component of the Mangin mirror group, the field lens group and the focusing lens group is aligned along a received light axis (Fig. 6) and further wherein the Mangin mirror element, the at least one focusing lens, and the at least one field lens are configured to balance aberrations therebetween, the aberration balancing reducing decenter sensitivity of the Mangin mirror element, the at least one focusing lens and the at least one field lens (col. 10 lines 20-30), wherein the objective is optimized to produce minimum spherical aberration, axial color, and chromatic variation of aberrations (col. 10 lines 20-30); wherein the at least one Mangin mirror element is optimized to produce spherical, axial color, and chromatic variation of aberrations to compensate for aberrations induced by the focusing lens group (col. 10 lines 20-30); wherein each lens used in the objective has a diameter of less than approximately 25 millimeters (Fig. 6); and wherein said at least one Mangin mirror element (604 and 606) comprises a single lens/mirror element comprising substantially curved concave surface (top surface in figure); and a second minimally curved surface (bottom surface in figure). Shafer '298 lacks the controlled light energy going through an immersion substance to the specimen and wherein both surfaces of the single lens/mirror element are reflective with small central apertures through which light energy may pass. Yonekubo teaches using an immersion substance, including water and oil, to obtain better imaging performance (columns 1-2). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a well known immersion substance with the objective of Shafer '298 as taught by Yonekubo to provide better

Art Unit: 2872

imaging performance because of reduced reflections due to the index matching provided by the immersion substance.

Regarding claims 44-45, 56, 66-68, 64, 79-80, 91 and 99, Shafer '298 in view of Yonekubo as set forth above disclose the claimed invention except for wherein said objective has a field size of approximately 0.15 mm and a numerical aperture of approximately 1.2. It would have been obvious to one having ordinary skill in the art at the time the invention was made to make objective have a field size of approximately 0.15 mm and a numerical aperture of approximately 1.2, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. One would have been motivated to have the objective have a field size of approximately 0.15 mm and a numerical aperture of approximately 1.2 for the purpose of providing a larger field of view. *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977) See also *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claims 47-48, 58, 60, 70, 71, 82, 83, 93 and 95, Shafer '298 in view of Yonekubo as set forth above further disclose said objective having a long working distance used with a microscope (Shafer '298, col. 10 lines 20-30) having a flange (at 102 or 802) but is silent as to the location of the flange being approximately 45 millimeters from the specimen during normal operation or at least approximately 100 millimeters from the specimen during normal operation. It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the flange be approximately 45 millimeters from the specimen during normal operation or at least approximately 100 millimeters from the specimen during normal operation, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. One would have been motivated to have the flange

Art Unit: 2872

be approximately 45 millimeters from the specimen during normal operation or at least approximately 100 millimeters from the specimen during normal operation for the purpose of having an appropriate working area for interacting with/changing the specimen. *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977) See also *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claims 49, 61-62, 72, 84 and 96-97, Shafer '298 teaches in Fig. 6 an objective for use with light energy having a wavelength in the range of approximately 157 nanometers through the infrared light range with field and focusing lenses and a Mangin mirror element less than approximately 100 millimeters (Fig. 9) wherein only two glass materials are used (Table 3) comprising fused silica and calcium fluoride (Table 3). Shafer '298 lacks the controlled light energy going through an immersion substance to the specimen and said Mangin mirror element receiving said intermediate light energy through a back/rear side thereof. Immersion substances, including water and oil are well known in the microscope/lithography art to obtain better imaging performance. Yonekubo teaches using an immersion substance, including water and oil, to obtain better imaging performance (columns 1-2). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a well known immersion substance with the objective of Shafer '298 as taught by Yonekubo to provide better imaging performance.

Claims 52, 75 and 87 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shafer '298 et al. in view of Yonekubo as applied to claims 43, 66 and 78 above and further in view Deutsch et al., WO 01/57563 A2.

Art Unit: 2872

Shafer '298 in view of Yonekubo as applied to claims 43 and 78 above disclose the claimed invention except for the immersion substance being a silicone gel. Deutsch teaches using a silicone gel as an immersion substance (page 2, lines 18-20). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the immersion substance of Shafer '722 in combination with Yonekubo and Shafer '298 be a silicone gel as suggested by Deutsch et al. to provide more controllable flow characteristics to the immersion substance

Response to Arguments

Applicant's arguments filed July 26, 2010 have been fully considered but they are not persuasive.

Applicant argues the Shafer'298 reference fails to teach a Mangin mirror between the field lens group and the specimen. Fig. 6 of Shafer'298 clearly shows Mangin mirrors (604 and 606) between field lens group (603) and specimen (not shown but on extreme right end of system).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

Art Unit: 2872

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to /JOSHUA L. PRITCHETT/ whose telephone number is (571)272-2318. The examiner can normally be reached on Monday - Friday 7:00 - 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephone B. Allen can be reached on 571-272-2434. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2872

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/JOSHUA L PRITCHETT/
Primary Examiner
Art Unit 2872